## PRELIMINARY GEOLOGIC MAP OF THE MEDFORD 1° X 2° QUADRANGLE, OREGON AND CALIFORNIA

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial

DESCRIPTION OF MAP UNITS HORNBLENDE-BEARING TUFF SEQUENCE

SURFICIAL DEPOSITS

SEDIMENTARY ROCKS

VOLCANIC ROCKS OF THE HIGH CASCADE RANGE

PYROCLASTIC DEPOSITS

ALKALINE(?) INTRUSIVE ROCKS

IN THE WESTERN PART OF THE QUADRANGLE

VOLCANIC ROCKS OF THE WESTERN CASCADE RANGE

PYROCLASTIC, VOLCANICLASTIC, AND SEDIMENTARY ROCKS

VOLCANIC ROCKS

CORRELATION OF MAP UNITS VOLCANIC ROCKS OF THE HIGH CASCADE RANGE SURFICIAL DEPOSITS VOLCANIC ROCKS OF THE WESTERN CASCADE RANGE - AGE RELATIONS UNKNOWN SEDIMENTARY ROCKS ROCKS OF THE WESTERN HALF OF THE QUADRANGLE METASEDIMENTARY, METAVOLCANIC, AND ULTRAMAFIC ROCKS Pyroxene-bearing tuff sequence

INTERMEDIATE AND HIGH GRADE METAMOPHIC ROCKS

ALLUVIUM (HOLOCENE AND PLEISTOCENE) LANDSLIDE DEPOSITS (HOLOCENE AND PLEISTOCENE) ALLUVIAL FAN DEPOSITS (HOLOCENE AND PLEISTOCENE) GLACIAL DEPOSITS (HOLOCENE AND PLEISTOCENE) TERRACE GRAVEL (PLEISTOCENE)-Unconsolidated slightly to moderately weathered deposits of sand, silt, and gravel that form terraces 6 to 40 m above modern flood plains
OLDER TERRACE GRAVEL (PLEISTOCENE AND PLIOCENE)—Deeply weathered, auriferous deposits of sand, silt, and gravel that form terraces ranging from 15 to 210 m above modern flood plains. Occurs only in the UPLAND GRAVEL (MIOCENE)—Deeply weathered lithified deposits of sand and gravel with minor amounts of silt and coal. The deposits are not integrated with modern drainages and occur only as small scattered patches in the western half of the quadrangle DIATOMITE AND VOLCANICLASTIC SEDIMENTS (PLIOCENE AND MIOCENE)—Flat-lying lake beds and deltaic beds in the upper Rogue River Valley BASALT (HOLOCENE AND PLEISTOCENE)—Composed of olivine-bearing pahoehoe flows and interbedded cogenetic near-vent pyroclastic deposits. Forms shield volcanoes ANDESITE (HOLOCENE AND PLEISTOCENE)-Rocks of this unit are extremely varied in texture and mineralogy, but a majority are porphyritic pyroxene andesite. Forms youthful-looking stratovolcanoes, steep-sided shields and DACITE AND RHYOLITE (HOLOCENE AND PLEISTOCENE)—Gray to black stubby flows and domes. Unit crops out only in Crater Lake National Park BASALT (PLEISTOCENE AND PLIOCENE)-Most lavas of this unit are dark vesicular olivine pahoehoe flows. They form intracanyon flows and flank flows which are far removed from possible source vents on shield volcanoes. BASALTIC ANDESITE (PLEISTOCENE AND PLIOCENE)—Blue-gray microvesicular olivine and olivine-bearing flows forming deeply eroded coalescing shield volcanoes along the crest of the Cascade Range NDESITE (PLEISTOCENE AND PLIOCENE)-Small scattered remnants of originally more extensive andesite flows which are surrounded and partly covered by younger volcanic rocks. Lithologically similar to Holocene and BASALT (PLIOCENE AND UPPER MIOCENE)-Fine-grained high-alumina olivine basalt flows and deeply incised coarse-grained diktytaxitic olivine basalt flows. Forms subdued and greatly eroded shields. Areas underlain by this unit are generally covered by thick clay-rich red soils
BASALTIC ANDESITE (PLIOCENE AND UPPER MIOCENE)—The most common lithology is light-blue-gray finegrained high-alumina olivine basaltic andesite. Occurs as large deeply eroded coalescing shield volcanoes, interbedded cogenetic near-vent pyroclastic deposits, and extensive valley-filling flows ANDESITE (PLIOCENE AND UPPER MIOCENE)-Mostly pyroxene andesite, but the unit contains rocks with a variety of textures and mineralogies. Occurs as deeply eroded large composite volcanoes, steep-sided shields, smaller vent areas, and extensive valley-filling flows PUMICE AND ASH OF MT. MAZAMA (HOLOCENE)-White, pink, buff, gray and black rhyodacite, dacite, and andesite, unwelded to partly welded ash-flow tuff, ash-cloud deposits, and unconsolidated ash-fall deposits erupted during the climactic phase of volcanic activity of Mount Mazama YOUNGER PYROCLASTIC DEPOSITS OF BASALTIC AND ANDESITIC CINDER CONES (HOLOCENE AND PLEISTOCENE)-Unconsolidated to poorly consolidated well stratified red, brown and black, fine- to coarsegrained basaltic to andesitic ejecta of ash, cinder, scoria, agglomerate, and bombs. Unit includes minor flows and feeder dikes, as well as yellow to buff plagonitized tuff. The tuff was deposited in tuff rings, which crop out OLDER PYROCLASTIC DEPOSITS OF BASALTIC AND ANDESITIC CINDER CONES (PLEISTOCENE AND PLIOCENE)-Unconsolidated to poorly consolidated well stratified red, brown, and black, fine- to mediumgrained basaltic to andesitic ash, cinder, scoria, tuff breccia, agglomerate, and bombs. Includes minor flows, thin feeder dikes, and vent breccia. Constructional volcanic features are poorly preserved Many small intrusive bodies are present in the volcanic rocks of the High Cascade Range. For the most part they consist of solidified lava in central conduits, plugs, dikes and sills. Only the larger bodies are shown on this map. MAFIC INTRUSIVE ROCKS (HOLOCENE AND PLEISTOCENE) NTERMEDIATE INTRUSIVE ROCKS (HOLOCENE AND PLEISTOCENE) MAFIC INTRUSIVE ROCKS (PLEISTOCENE AND PLIOCENE) INTERMEDIATE INTRUSIVE ROCKS (PLEISTOCENE AND PLIOCENE) MAFIC INTRUSIVE ROCKS (PLIOCENE AND UPPER MIOCENE) NTERMEDIATE INTRUSIVE ROCKS (PLIOCENE AND UPPER MIOCENE) DACITE AND DACITE PORPHYRY DIKES (OLIGOCENE)-Light-colored fine-grained dike rocks in the southwest corner of the quadrangle. Correlated with the Mt. Emily intrusion in the Coos Bay 10 x 20 quadrangle The volcanic rocks of the Western Cascade Range form a structurally simple but stratigraphically complex package of terrestrial volcanic, volcaniclastic, and sedimentary rocks some 5,500 m thick. The volcanic rocks of the Western Cascade Range are composed of many overlapping and intertonguing volcanogenic and sedimentary units. Individual peds generally extend for only a few kilometers to a few tens of kilometers BASALT, BASALTIC ANDESITE, AND ANDESITE (MIOCENE AND OLIGOCENE)- Basalt, basaltic andesite, and andesite flows and interbedded volcanic breccia, and pyroclastic deposits. Locally includes other rock types in peds too thin, discontinous, or poorly exposed to map separately. Divided into 4 units based on K-Ar Unit 4 (MIOCENE Unit 3 (MIOCENE AND OLIGOCENE) SILICIC FLOW ROCKS AND SHALLOW INTRUSIVE ROCKS (MIOCENE AND OLIGOCENE)—Generally light-colored rhyolite and rhyodacite in stubby flows, domes, and shallow intrusives and associated breecia. Locally contains a few scattered small phenocrysts of plagioclase, hypersthene, or hornblende. Commonly flow banded, generally devritified. Divided into 2 units based on K-Ar determinations Unit 3 (MIOCENE AND OLIGOCENE) INTERMEDIATE AND SILICIC ASH-FLOW TUFF (MIOCENE AND OLIGOCENE)—Welded to nonwelded ash-flow tuffs, dominantly intermediate in composition. Most ash-flow tuffs show extensive vapor phase alteration and devritification. Basal vitrophyres are rare. Included rock fragments are common. Plagioclase is the dominant phenocryst mineral, and in many flows is the only phenocryst. May also contain minor amounts of phenocrystic quartz, biotite, hornblende or pyroxene. Locally includes interbedded coarse-grained debris flow deposits and beds of fine-grained volcaniclastic material. Divided into 5 units based on K-Ar determinations and lithology Unit 3 (MIOCENE AND OLIGOCENE) Unit 1 (OLIGOCENE)—Locally includes: ASH-FLOW TUFF OF BOND CREEK (OLIGOCENE)—Thick regionally extensive biotite quartz rhyodacite ashflow tuff composed of two major cooling units (Smith and others, 1980). Thickness, of the lower cooling unit variable due to pre-eruption topography, thickness of upper cooling unit variable because of posteruption channeling COARSE-GRAINED FACIES (MIOCENE AND OLIGOCENE)—Coarse-grained rocks of pyroclastic, volcaniclastic, and sedimentary origin. Includes tuff-breccia formed by direct pyroclastic origin and by reworking of just-vented and unlithified pyroclastic ejecta, volcanic conglomerate, mudflow deposits, and block-and-ash(?) deposits. Includes all of the vent facies of Smedes and Prostka (1972), as well as coarser units in their alluvial facies Unit 3 (MIOCENE AND OLIGOCENE) Unit 2 (OLIGOCENE) FINE-GRAINED FACIES (MIOCENE AND OLIGOCENE)-Medium- and fine-grained rocks of pyroclastic, volcaniclastic, and sedimentary origin. Includes volcanic sandstone, siltstone, and mudstone, diatomite, and airfall tuff. Includes finer grained part of alluvial facies of Smedes and Prostka (1972). Divided into 4 units based on K-Ar determinations Unit 4 (MIOCENE Unit 3 (MIOCENE AND OLIGOCENE) Dikes, sills, plugs, and stocks. More common near volcanic centers. MAFIC INTRUSIVE ROCKS (MIOCENE AND OLIGOCENE)-Rocks in this unit range from fine-grained pyroxene gabbro to black aphanitic glassy basalt, and have a wide variety of textures INTERMEDIATE INTRUSIVE ROCKS (MIOCENE AND OLIGOCENE)—Mostly hypabyssal. Locally hydrothermally

altered. Many plugs and stocks are probably subvolcanic magma chambers FELSIC INTRUSIVE ROCKS (MIOCENE AND OLIGOCENE)—May merge laterally with silicic flows. Locally contains phenocrysts of quartz, plagioclase, homblende, or pyroxene CENTRAL PART OF THE QUADRANGLE NONMARINE SEDIMENTARY ROCKS (UPPER EOCENE)—Stratified nonmarine conglomerate, pebble conglomerate, sandstone, siltstone and mudstone. Dominantly nonvolcanic; derived from underlying older rocks. Abundant NORTHWESTERN PART OF THE QUADRANGLE TYEE FORMATION (MIDDLE AND LOWER EOCENE)—Massively bedded micaceous lithic wacke, pebbly sandstone, cobble conglomerate, and minor siltstone and coal
FLUORNOY FORMATION OF BALDWIN (1974) (LOWER EOCENE)—Sandstone, mudstone, and conglomerate Conglomerate and sandstone predominate in the lower part and fine-grained sandstone and siltstone in the upper LOOKINGGLASS FORMATION OF BALDWIN (1974) (LOWER EOCENE)—Conglomerate, sandstone, and siltstone ROSEBURG FORMATION OF BALDWIN (1974) (LOWER EOCENE)—Thin-bedded laminated dark- to medium-gray siltstone with graded beds and local marly beds; exposed only in extreme northwestern corner of the quadrangle ROCKS OF THE WESTERN HALF OF THE QUADRANGLE

CLASTIC SEDIMENTARY ROCKS (UPPER AND LOWER CRETACEOUS)-Locally fossiliferous sandstones and conglomerates. Includes such units as the sandstones and conglomerates on the West Fork of the Illinois River ear Waldo (Imlay and others, 1959), the Hornbrook Formation of Peck and others (1956), and the Grave Creek Strata of Jones (1960) and Page and others (1977) MYRTLE GROUP (LOWER CRETACEOUS AND UPPER JURASSIC)—Locally fossiliferous conglomerates, sandstones siltstones, and limestones. Includes such units as the Riddle Formation and Days Creek Formation (Imlay and DOTHAN FORMATION (LOWER CRETACEOUS AND UPPER JURASSIC)—As mapped divided int

Sedimentary rocks—Sandstones, conglomerates, and graywacke which rarely contain <u>Buchia piochii</u>
Chert—Predominantly rhythmically banded and lenticular chert, moderately recrystallized, and locally containing radiolarians of Upper Jurassic to Lower Cretaceous age. As mapped, shown only at the northern border of the quadrangle, but occurs as isolated small bodies throughout the formation Volcanic rocks-Predominantly basaltic volcanic rocks, including pillow lavas, volcanic breccia, and silicified basalt. As mapped, shown only along the tectonic boundaries of the Dothan Formation but also occurs as OTTER POINT FORMATION (LOWER CRETACEOUS AND UPPER JURASSIC)—Highly sheared graywacke, mudstone siltstone, and shale with lenses and pods of sheared greenstone, limestone, chert, and serpentinite. Includes blueschist pods correlated by Koch (1966) with the Dothan Formation

SERPENTINITE (LOWER CRETACEOUS AND UPPER JURASSIC)—Serpentinized harzburgite, dunite, and pyroxenite

KJg GRANITIC PLUTONIC ROCKS (CRETACEOUS AND JURASSIC)-Tonalite and quartz diorite predominate but dioritic, monzodioritic, quartz monzodioritic, granodioritic, monzonitic, quartz monzonitic, and rocks of other granitic compositions are included in map unit. K-Ar determinations on hornblende suggest the plutons range in age from 166 m.y. to 143 m.y. (Hotz, 1971); large masses are shown on the map, however, there are many unmapped dikes, sills, and smaller masses intruding Paleozoic through Jurassic rocks MAFIC AND ULTRAMAFIC ROCKS ASSOCIATED WITH GRANTIC PLUTONS (CRETACEOUS AND JURASSIC)-Consists predominantly of hornblende gabbro, gabbro, and olivine gabbro but includes pyroxenite, hornblende pyroxenite, minor peridotite, dunite, and serpentinite TONALITE AND QUARTZ DIORITE OF CHETCO RIVER COMPLEX OF HOTZ (1971) (JURASSIC)-Diorite, quartz diorite, and tonalite. K-Ar determinations are 153 and 155 m.y. (Hotz, 1971) MUSCOVITE GRANODIORITE (JURASSIC)—Medium-grained equigranular, locally foliated granodiorite composed of plagioclase, quartz, potassium feldspar, muscovite, and biotite. K-Ar determination on muscovite yielded an age QUARTZ PORPHYRY (JURASSIC)—Light-gray porphyritic quartz diorite containing euhedral quartz phenocrysts as

large as 2 cm in diameter and euhedral olive-brown hornblende phenocrysts as long as 1 cm in a fine-grained groundmass of subhedral to euhedral plagioclase and quartz
HORNBLENDE GABBRO (JURASSIC)—Fine- to coarse-grained hornblende gabbro that intruded ultramafic and gabbro units of older ophiolite sequences

hornblende-pyroxene gabbro and subordinate plagioclase-rich flow rocks

colleted gray to black schists near contacts with plutons

METASEDIMENTARY, METAVOLCANIC AND ULTRAMAFIC ROCKS SHALE, MUDSTONE, AND SANDSTONE OF THE ILLINOIS VALLEY (JURASSIC)-Black to gray shale, mudstone, and sandstone with local pebbly conglomerate lenses
METASHALE, METAMUDSTONE, AND QUARTZ-RICH METASANDSTONE (JURASSIC)—Predominantly black shales

BLACK CLAST BRECCIA (JURASSIC)—Green volcanic breccia containing clasts as large as 1 m across composed of

and mudstones, but containing local sandstone beds with shale chips. Metamorphosed to thinly laminated and

TUFFACEOUS SILTSTONE, SANDSTONE, AND SHALE (JURASSIC)-Predominantly shale interbedded with mudstones and sandstones with local conglomerate beds. Pyritized tuffaceous siltstone abundant toward base BASALT IN SHALE (JURASSIC)—Foliated greenstone which is in part conformable on Jurassic shale and siltstone (Js) and interpreted to represent thin flows
SHALE AND SILTSTONE (JURASSIC)—Thinly bedded black to gray shales with interbedded siltstone and local sandstone. Contacts with volcanic units (Jht and Jbs) are locally conformable

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HORNBLENDE-BEARING TUFFS (JURASSIC)-Massively bedded and jointed, fine-grained bedded tuffs and coarsegrained tuffs that are not obviously bedded. Interbedded plagioclase-rich meta flows contain actinolite AMYGDALOIDAL ANDESITE (JURASSIC)—Amygdaloidal porphyritic plagioclase-rich andesite flows interbedded with glomeroporphyritic nonamygdaloidal andesite flows and flow breceias containing clasts of amygdaloidal andesite GLASSY BASALTIC ANDESITE (JURASSIC)-Black, commonly aphanitic, strongly foliated andesite flows locally interbedded with crystal lithic tuffs containing clasts of the andesite flows ROCKS BETWEEN SUNNY VALLEY AND THE ILLINOIS RIVER VALLEY

SHALE AND MUDSTONE OF GRAVE CREEK (JURASSIC)—Thinly laminated shales and blocky mudstones. Tuff beds well developed at the confluence of Tom East Creek and Grave Creek, but rare throughout rest of sequence. Quartz veining and pyritization common throughout the sequence
ANDESITIC WATERWORKED TUFFS AND AGGLOMERATES (JURASSIC)—Water-laid and water-reworked tuff beds and massive agglomerates with clasts typically 1 mm to 3 cm long but are as large as 10 cm. Locally includes: Shale and mudstone interbedded with andesitic water-worked tuffs-Finely laminated interbedded tuffaceous siltstone, shale, and mudstone GALICE FORMATION (JURASSIC)—Thinly layered mudstones and shales which are locally fossiliferous containing Buchia concentria (Sowerby)
METAVOLCANIC ROCKS WITH INTERBEDDED SHALE (JURASSIC)—Basaltic to andesitic amygdaloidal flows and ophitic flows with tuff, tuff breccia, and volcaniclastic rocks. Locally contains interbedded black shale and mudstone units as thick as 100 m and local chert beds METAVOLCANIC ROCKS, UNDIFFERENTIATED (JURASSIC)-Highly altered, sheared, and locally phyllonitic and schistose rocks of uncertain correlation

the shale and siltstone unit (Js)
METAVOLCANIC ROCKS (JURASSIC)—Foliated tuffs, flows, and fragmental volcanic rocks

RHYOLITIC FLOWS AND OBSIDIAN (JURASSIC)-Rhyolitic flows, flow breccias, and rare devitrified perlitic

SHALE OF SUNNY VALLEY (JURASSIC)-Shales, mudstones, and minor amounts of sandstone. May correlate with

VOLCANIC TUFF BRECCIA (JURASSIC)—Coarse andesitic volcanic tuff breccia with blocks as large as 1 m across but averaging less than 20 cm set in a pyroxene-bearing tuffaceous matrix. Dacite porphyry flows and hyodacite flows and plugs occur locally PYROXENE-BEARING TUFF, AGGLOMERATE, AND FLOWS (JURASSIC)-Andesitic to dacitic thin-bedded and massive tuff, tuff breccia, agglomerate, waterworked tuff, breccia, and wacke, including local interbedded black PYROXENE-BEARING AGGLOMERATE (JURASSIC)—Andesitic volcanic agglomerate containing distinctive green clinopyroxene xenocrysts as large as 1 cm in diameter. Unit includes interbedded flows and dikes
RHYODACITE FLOWS AND BEDDED TUFFS (JURASSIC)—Predominantly rhyodacite flows and very fine grained bedded porcelaneous tuffs with local agglomerate, andesite, and basalt flows

PORPHYRITIC ANDESITIC AND DACITIC FLOWS (JURASSIC)-Predominantly plagioclase porphyritic andesitic flows but includes dacitic to andesitic flows, tuffs, and agglomerates JOSEPHINE OPHIOLITE OF HARPER (1980)

VOLCANIC ROCKS OF THE WILD ROGUE WILDERNESS AND

DIKE COMPLEXES AND MAFIC VOLCANIC ROCKS (JURASSIC)-Pillow basalt, and minor buff-colored keratophyres with sparse diabase dikes compose the stratigraphic top of the unit; complexes of subophitic-textured diabase form the base of the unit. Metamporphosed to zeolite and greenschist facies. Exposed near southwest corner of GABBROIC ROCKS (JURASSIC)—Hornblende gabbro, tonalite, and quartz diorite, and cumulus clinopyroxene that contains subordinate cumulus norite CUMULATE ULTRAMAFIC ROCKS (JURASSIC)—Repetitive interlayered sequences of cumulus wehrlite and dunite, with minor clinopyroxenite and harzburgite JOSEPHINE PERIDOTITE (JURASSIC)—Harzburgite and dunite with tectonite fabric containing minor pyroxenite layers, dikes, and dikelets

MELANGE OF THE TAKILMA AREA CHERT, ARGILLITE, CONGLOMERATE, AND SILTY SANDSTONE (JURASSIC)—Thin-bedded chert, lenses of marble, silty argillite, and conglomerate. Locally interbedded with mafic lava. Chert contains radiolaria of Middle BASALTIC ROCKS (JURASSIC)—Includes diabase, diabase breccia, gabbro, and basaltic lavas SERPENTINITE (JURASSIC)—Completely serpentinized peridotite and dunite

OPHIOLITE OF ONION MOUNTAIN AREA

SHALE AND MINOR CHERT (JURASSIC)—Shale, thinly bedded siltstone and mudstone with red and white radiolarianbearing thinly bedded chert BASALTIC VOLCANIC ROCKS (JURASSIC)—Pillow basalts, pillow breccias, and basaltic-andesitic flows GABBROIC ROCKS AND DIKE COMPLEXES (JURASSIC)-Massive gabbroic rocks that locally contain dike ULTRAMAFIC CUMULATE AND TECTONITE ROCKS (JURASSIC)—Serpentinized peridotite and dunite with tectonite fabrics, chromitite, and locally cumulus dunite, peridotite, and wehrlite OPHIOLITE OF SEXTON MOUNTAIN AREA

METAVOLCANIC AND SHALLOW INTRUSIVE ROCKS (JURASSIC)-Pillow basalt and pillow breecia, basalt flows, flow breccia, and agglomerate with gabbro, diabase, and metagabbro dikes and sills GABBRO AND METAGABBRO (JURASSIC)—Layered and massive gabbroic rock SERPENTINITE (JURASSIC)—Serpentinized peridotite and dunite with local concentrations of chromite OPHIOLITE OF PEARSOLL PEAK AREA

SHEETED DIKE COMPLEX (JURASSIC)—Thin (1-3 m) multiple parallel dikes CUMULATE GABBRO (JURASSIC)—Two-pyroxene gabbro, locally metamorphosed to hornblende-plagioclase gabbro PERIDOTITE (JURASSIC)—Harzburgite and dunite with both tectonite and cumulate fabrics; locally completely ILLINOIS RIVER GABBRO OF JORGENSON (1970)

METAGABBRO (JURASSIC)—Hornblende-plagioclase gabbro, locally including dioritic and quartz dioritic rocks. Unit has a metamorphic K-Ar age determined from hornblende of 151±5 m.y. (Coleman, 1972) CUMULATE PERIDOTITE, DUNITE, PYROXENITE, AND WEHRLITE (JURASSIC) OPHIOLITE OF ROGUE RIVER AND RIDDLE AREAS

SHEFTED DIABASE DIKES (JURASSIC)-Sheeted dikes with associated porphyritic dikes and gabbroic screen GABBRO (JURASSIC)-Hornblende (after pyroxene)-plagioclase gabbro. Possesses metacumulate foliation where included as sheeted dike screen, other exposures are massive SERPENTINIZED ULTRAMAFIC ROCKS (JURASSIC)—Serpentinized peridotite and dunite; predominantly crops out as slickentite in Rogue River area. Includes minor gabbro, blocks of metavolcanic and metasedimentary rocks in

APPLEGATE GROUP

METASEDIMENTARY ROCKS (TRIASSIC TO PALEOZOIC) PORPHYRITIC PYROXENE ANDESITE (TRIASSIC TO PALEOZOIC) PORPHYRITIC ANDESITIC FLOWS, TUFFS, AND AGGLOMERATES (TRIASSIC TO PALEOZOIC)—Charactierized by plagioclase phenocrysts in a relict pilotaxitic groundmass in flows and agglomerate clasts
ANDESITIC AND DACITIC TUFFS, TUFF BRECCIAS, AND AGGLOMERATES (TRIASSIC TO PALEOZOIC) PORPHYRITIC ANDESITE (TRIASSIC TO PALEOZOIC)—Andesitic flows and agglomerate, which contain abundant plagioclase phenocrysts, clasts of porphyritic andesite, and local interbedded crystal-rich tuffs
VESICULAR ANDESITIC TO BASALTIC FLOWS (TRIASSIC TO PALEOZOIC)—Vesicular basaltic to porphyritie andesitic flows. Pillow breccias and pillow basalts occur locally near top of unit. Impure marbles containing

volcanoclastic waterworked debris occur locally PORPHYRITIC HORNBLENDE ANDESITE (TRIASSIC TO PALEOZOIC)—Predominantly flows, but unit includes minor amounts of pyroclastic rocks, local amygdaloidal flows, and porphyritic dacites that contain quartz and PORPHYRITIC HORNBLENDE ANDESITE AND ARGILLITE (TRIASSIC TO PALEOZOIC)—Predominantly porphyritic hornblende andesitic flows interbedded with agillites (T P ar), but also contains andesitic pyroclastic rocks interbedded with andesitic to dacitic and rhyodacitic flows and agglomerates. Locally includes: Argillite—Aphanitic bedded tuff, volcaniclastic mudstones, and sandstones PORPHYRITIC AUGITE AND ESITE AND ANDESITIC BASALT (TRIASSIC TO PALEOZOIC)—Porphyritic andesite to basalt flows and subordinate interbedded agglomerates and breccias, minor andesitic tuff breccias, dacitic to rhyodacitic breccias, tuffs, and porphyritic flows, porphyritic basalts, and basaltic intrusives. Locally includes:

Metasedimentary rocks-Shale, mudstone, volcaniclastic sandstones, graywacke, lithic wacke, conglomerate, waterworked cherty tuffs, minor radiolarian, recrystallized banded chert and marble ROCKS OF SEIAD VALLEY QUARTZITE, METASEDIMENTARY ROCKS, MARBLES, AND INTERMEDIATE TO SILICEOUS METAVOLCANIC ROCKS (TRIASSIC TO PALEOZOIC) DACITIC TO ANDESITIC METAVOLCANIC ROCKS (TRIASSIC TO PALEOZOIC)-Massive to foliated, regionally

TA PZu ULTRAMAFIC ROCKS (TRIASSIC TO PALEOZOIC)—Serpentinized and partially serpentinized peridotite and dunite occurring in fault zones MELANGE OF DUTCHMANS PEAK AMPHIBOLITE (TRIASSIC TO PALEOZOIC)-Interlayered metasedimentary and metavolcanic rocks metamorphosed to upper greenschist almandine-amphibolite facies

The Pzsp SERPENTINITE (TRIASSIC TO PALEOZOIC)—Serpentinized peridotite and dunite, local chromitite pods, lenses, and

metamorphosed dacitic to andesitic flows, flow breccias, agglomerate, tuffs and tuff breccia, interlayered with

GABBRO AND METAGABBRO (TRIASSIC TO PALEOZOIC)—Quartz-bearing hornblende gabbro INTERMEDIATE AND HIGH GRADE METAMORPHIC ROCKS CONDREY MOUNTAIN FORMATION (TRIASSIC TO PALEOZOIC)—Divided into: Muscovite-quartz schist-Muscovite-quartz schist with subordinate quartz-graphite muscovite schists and rare thin

Chlorite schist—Quartz-actinolite-epidote-chlorite schist Metaserpentinite-Predominantly antigorite-magnetite-brucite rocks with minor tale-magnesite schist and clinozoisite-actinolite-albite-garnet metagabbro MAY CREEK FORMATION (PALEOZOIC)—Divided into: Schist and quartzite-Schistose and locally gneissose rocks. Exposed in central part of the quadrangle Layered amphibolite-Foliated amphibole-rich granofels, schist, and gneiss AMPHIBOLITE (AGE UNKNOWN)—Composed of structurally complex amphibole schist and quartz-rich hornblende

gneiss with local impure quartzite. Exposed near southwest corner of the quadrangle
BRIGGS CREEK AMPHIBOLITE OF COLEMAN AND OTHERS (1976) (AGE UNKNOWN)—Amphibolite, micaceous quartzite, quartz schist, and recrystallized manganiferous chert · Contact—Dotted where concealed \_\_\_\_. Fault—Dashed where inferred, dotted where concealed. Ball and bar on downthrown side

Thrust or high-angle reverse fault-Dashed where inferred, dotted where concealed. Sawteeth on upper plate - . \_ . - Boundary between individual coalescing volcanoes composed of rocks of the same map unit

Approximate location of major volcanic vents \* Vents of cinder cones

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